NESTING HABITAT AND NEST SITE CHARACTERISTICS OF THE WHITE-BELLIED SEA-EAGLE IN THE GIPPSLAND LAKES REGION OF VICTORIA, AUSTRALIA

by
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Abstract

Thirteen nesting territories and 16 nesting trees used by the White-bellied Sea-Eagle (*Haliaeetus leucogaster*) in the Gippsland Lakes region of Victoria, Australia, are described. Concern is expressed about previous losses of nesting habitat and the insecurity of over half of the nesting territories presently active in the area.

Introduction

The White-bellied Sea-Eagle (*Haliaeetus leucogaster*) is well-known around the coastal lakes in the Gippsland Lakes region (Fig. 1), but its biology in the region has never

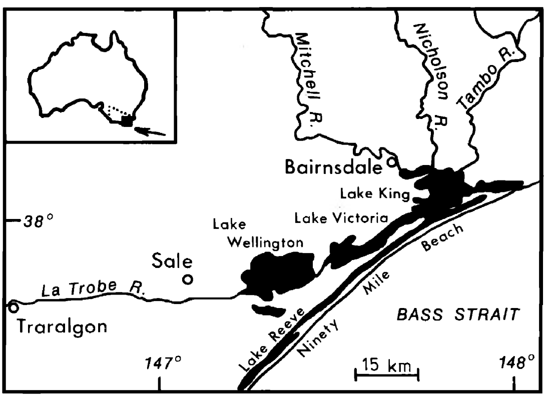

Figure 1. Gippsland Lakes region of Victoria, Australia.

been studied. The only substantial work conducted on the species in Victoria has been along the Murray River (Favaloro 1944); little work has been done elsewhere in Australia.

During 1978 and 1979 we made a concerted effort to find the nesting territories of sea-eagles in the Gippsland Lakes region (excluding Lake Tyers) by searching for nests on the ground and from aircraft, and by obtaining information from local inhabitants. Aerial surveys of known nests were conducted twice during both 1979 and 1980. Here we describe the vegetation in the territories and some characteristics of nesting sites.

Results

Thirteen active (eggs or young or both were present during one or more breeding seasons) nesting territories were found in the Gippsland Lakes region during the 1978–1980 breeding seasons (Table 1). Nine of the 13 territories were within 1 km of one of the coastal lakes in the Gippsland Lakes region. The other four territories were between 2 km and 13 km from the nearest coastal lake, but all were within 1 km of either a large swamp or a river. Seven territories were on private land, another five on public land and one was partially on private and public land.

Table 1. Breeding activity in sea-eagle territories during 1978–1980

Territory	Active* during:			Number of different trees used for nesting during the 3 seasons
	1978	1979	1980	
1	Yes	Yes	Yes	2
2	Yes	Yes	Yes	1
3	Yes	No	No	1
4	Yes	Yes	No	1
5	Yes	Yes	?	1
6	Yes	?	No	1
7	Yes	Yes	Yes	2
8	Yes	No	No	1
9	Yes	Yes	No	1
10	?	Yes	Yes	1
11	?	Yes	No	1
12	?	Yes	No	1
13	?	Yes	Yes	2

*Eggs or young or both observed

The 13 territories were located in 5 vegetation formations comprising eight vegetation units each dominated by 1 or 2 different species of trees (Table 2). In 3 of the nesting territories 2 different trees were used for nesting during the 3 seasons (Table 1). Thus from the 13 territories we have data on 16 different active nest sites (Table 3). The average height of trees supporting nests was 27.8 m and the average diameter at breast height was 1.1 m. Nests were at an average height of 18.9 m. All trees except two *E. tereticornis* were alive, although one *E. botryoides* had been recently burnt and epicormic growth was occurring.

One nest measured *in situ* was 2.4 m deep and 1.2 m × 2.1 m wide; the nesting cup was 0.3 m deep, 0.6 m × 0.8 m wide and lined with fresh eucalypt leaves.

Table 2. Vegetation units where active sea-eagle nests were found at least once in 1978, 1979 and 1980.

Formation / Dominant species	Height of dominants (m)	Characteristic features	Number of sea-eagle nests known to be active in each vegetation unit
Tall open-forest			
Eucalyptus pseudoglobulus	30–40	In sheltered gullies and slopes. Dense layer of *Pittosporum undulatum* to 12 m. *E. cypellocarpa* common at one site.	2
E. camaldulensis	30–40	On margin of large river. Shrub layer of *Acacia dealbata* to 12 m.	1
Open-forest			
E. globoidea	25–30	Dense layer of *Pteridium esculentum* to 1.5 m. Scattered *E. cypellocarpa* to 45 m.	
E. bosistoana	20–25	Scattered *E. globoidea, E. pseudoglobulus* and *E. ovata.* A few *E. bosistoana* to 45 m.	1
Open-forest to woodland			
E. bosistoana and *E. melliodora*	20–30	Dense layer of *Leptospermum phyllocoides* to 3 m. *E. viminalis* on adjacent sandy areas.	1
E. botryoides and *Banksia integrifolia*	10–25	Usually with a dense layer of *Pteridium esculentum* to 1 m. *Banksia serrata* and *Leptospermum laevigatum* also present.	3
Closed-scrub			
Melaleuca ericifolia	3–7	In waterlogged and low-lying areas. Scattered *E. tereticornis. Leptospermum juniperinum* was co-dominant at one site.	2
Pasture			
Introduced grasses and crops	<0.5	Scattered *E. tereticornis.*	2

Discussion

The total number of White-bellied Sea-Eagles nesting in the Gippsland Lakes region is unknown, but we are sure more nesting territories will be found as our study progresses. The present distribution of nesting pairs suggests that the removal of forests from many of the areas along the northern shores of Lakes King, Victoria and Wellington has resulted either in the loss of sea-eagle nests or in some pairs attempting to nest in sub-optimal habitats. Seven species of trees were used to support nests, but one of the 2 most commonly used, *E. tereticornis,* has been extensively cleared from the Gippsland

Table 3. Characteristics of active nest sites of the White-bellied Sea-Eagle.

Species of tree	Number of active nests found during the study	Mean height of tree (m)	Mean height of nest (m)	Mean diameter (m) of tree at breast height
Eucalyptus tereticornis	4	22	15	1.0
E. botryoides	4	23	18	0.8
E. bosistoana	2	34	25	1.2
E. cypellocarpa	2	40	23	1.2
E. camaldulensis	2	32	20	1.7
E. pseudoglobulus	1	27	23	1.4
E. melliodora	1	25	12	0.9
Totals	16	27.8	18.9	1.1
Standard error		2.1	1.4	0.1

Lakes region (Fell 1972) and today there remain only small remnant populations and occasional individual trees growing in other plant communities. We found sea-eagles nesting in surprisingly small remnants of forest (some pairs even nest in trees in pastures), but the need for more forest reserves, particularly those containing some *E. tereticornis,* is evident.

White-bellied Sea-Eagles usually build their nests in the taller trees, and generally 8–10 m below the top of the tree, although in our sample, one was located at the very top. The Bald Eagle (*Haliaeetus leucocephalus*) of North America is closely related to the White-bellied Sea-Eagle and a comparison of some of their nest site characteristics is of interest. A recent study of the Bald Eagle in Florida (McEwan and Hirth 1979) showed that of 18 nest trees all were *Pinus* (all 16 nest trees in our study were *Eucalyptus*), their average height was 26.3 m (compared to 27.8 m in our study), their average diameter at breast height was 0.6 m (1.1 m in our study) and the average height of nests was 22.4 m (ours was 18.9 m). Thus the average heights of the trees and of the nests were remarkably similar in the two studies. Further, while the height of the *Acacia* tree used in Africa by the Africa Fish Eagle (*Haliaeetus vocifer*) was not given by Brown and Hopcraft (1973), they mentioned that nests were about 20–30 m above the ground, once again similar to above data.

The diversity of habitats and of the types of trees used to support the nests suggest that sea-eagles attempt to build their nests in whatever is available provided they have ready access to a food source (mainly aquatic vertebrates) and provided their territory does not encroach upon that of another nesting pair. In areas which have little groundcover and which are easily accessible to man, human interference becomes a problem; although the sea-eagles may attempt to nest, they are unlikely to be successful (both of the nests in trees in pastures failed in 1979 and 1980). We are concerned that more than half (7 out of 13) of the nesting territories in our study is on private land. While most landholders are sympathetic toward the conservation of sea-eagles, economic pressures to clear the land for farming, for development or for timber will result in the destruction of some of these nesting habitats.

Acknowledgments

Our study of the White-bellied Sea-Eagle is continuing and we would be grateful for reports of possible nest sites in the Gippsland Lakes region. We thank C. M. Beardsell for his identifications of vegetation at the nest sites; D. D. Evans and F. I. Norman for their comments on drafts of the manuscript; A. Withers and R. Medling for their help in the field; and the many people who provided information on possible locations of sea-eagle territories.

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EGG LAYING IN A TWENTY-EIGHT YEAR OLD GOLDEN EAGLE

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Longevity of wild and captive birds of prey has been reviewed by Brown and Amadon (1968) and Newton (1979), but little or no mention is made of duration of reproductive capacity in raptors. The only information existing in avicultural literature is the suggestion that the captive Bald Eagle (*Haliaeetus leucocephalus*) should have a productive life span of 20 to 30 years (Hancock 1973). At what age do birds of prey cease to produce eggs or sperm?

In 1981, a tethered captive 28-year old Golden Eagle (*Aquila chrysaetos*), originally taken as a nestling in 1953 at Watson Lake, Yukon by F. Remmler, produced 2 eggs. This bird was held captive since 1973 at the Raptor Research facilities, McGill University, Montreal. It had apparently produced eggs previously, but the owner did not keep any records. No eggs were laid at McGill University until 1977, when the eagle was handled regularly by the junior author. Courtship behaviour towards people and subsequent egg-laying without a normal mate strongly suggests that this eagle was imprinted on man. The eggs were generally removed within 1 or 2 days of laying.

The pigmentation, length (mean = 7.33 cm) and breadth (mean = 5.32 cm) of eggs were quite uniform and similar to that reported for eggs of this species by Reed (1965) and Brown and Amadon (1968). Eggs were generally laid in the first 2 weeks of April, 4 in 1977, none in 1978, 2 in 1979, and 3 in 1980.

The longevity records summarized in Table 47, p. 367, by Newton (1979) indicate that some raptors can survive at least up to 26 years in the wild and up to 55 years in captivity. He further reported that eggs from an aging Peregrine Falcon (*Falco peregrinus*) tended to be smaller and paler than the normal. We have also observed this in a very old captive Red-tailed Hawk (*Buteo jamaicensis*). However, the role of old age in the potential reproductive output of any avian species will not be clearly understood until further information becomes available from both banding and captive breeding programs.